

## PATENT COOPERATION TREATY

## PCT

## INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

(Chapter II of the Patent Cooperation Treaty)

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference 421/96 PCT	<b>FOR FURTHER ACTION</b>		See Form PCT/IPEA/416
International application No. PCT/US05/04421	International filing date (day/month/year) 14 February 2005 (14.02.2005)	Priority date (day/month/year) 13 February 2004 (13.02.2004)	
International Patent Classification (IPC) or national classification and IPC IPC: <b>C08F 114/18</b> (2006.01) USPC: 526/242			
Applicant THE UNIVERSITY OF NORTH CAROLINA AT CHAPEL HILL			
<p>1. This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.</p> <p>2. This REPORT consists of a total of <u>3</u> sheets, including this cover sheet.</p> <p>3. This report is also accompanied by ANNEXES, comprising:</p> <p>a. <input type="checkbox"/> (sent to the applicant and to the International Bureau) a total of ___ sheets, as follows:</p> <p style="margin-left: 40px;"><input type="checkbox"/> sheets of the description, claims and/or drawings which have been amended and are the basis of this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions).</p> <p style="margin-left: 40px;"><input type="checkbox"/> sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box.</p> <p>b. <input type="checkbox"/> (sent to the International Bureau only) a total of (indicate type and number of electronic carrier(s)) _____, containing a sequence listing and/or tables related thereto, in electronic form only, as indicated in the Supplemental Box Relating to Sequence Listing (see Section 802 of the Administrative Instructions).</p>			
<p>4. This report contains indications relating to the following items:</p> <p><input checked="" type="checkbox"/> Box No. I Basis of the report</p> <p><input type="checkbox"/> Box No. II Priority</p> <p><input type="checkbox"/> Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability</p> <p><input type="checkbox"/> Box No. IV Lack of unity of invention</p> <p><input checked="" type="checkbox"/> Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement</p> <p><input type="checkbox"/> Box No. VI Certain documents cited</p> <p><input type="checkbox"/> Box No. VII Certain defects in the international application</p> <p><input type="checkbox"/> Box No. VIII Certain observations on the international application</p>			
Date of submission of the demand 26 May 2005 (26.05.2005)		Date of completion of this report 25 June 2008 (25.06.2008)	
Name and mailing address of the IPEA/ US Mail Stop PCT, Attn: IPEA/US Commissioner for Patents P.O. Box 1450 Alexandria, Virginia 22313-1450 Facsimile No. (571) 273-3201		Authorized officer Vasu S. Jagannathan DEBORAH A. THOMAS PARALEGAL SPECIALIST Telephone No. (571) 272-5522	

## INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.

PCT/US05/04421

## Box No. I Basis of the report

1. With regard to the **language**, this report is based on:

- ☒ the international application in the language in which it was filed.
- ☐ a translation of the international application into \_\_\_\_\_, which is the language of a translation furnished for the purposes of:
- ☐ international search (under Rules 12.3(a) and 23.1(b))
- ☐ publication of the international application (under Rule 12.4(a))
- ☐ international preliminary examination (under Rules 55.2(a) and/or 55.3(a))

2. With regard to the **elements** of the international application, this report is based on (*replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report*):

☐ the international application as originally filed/furnished

☒ the description:

pages 1-5,7-30,32-36,38-43,45-52,54-75,77-82 and 85-106 as originally filed/furnished

pages\* 6,31,37,44,53,76,83,84 and 107-110 received by this Authority on 26 May 2005

(26.05.2005)

pages\* NONE received by this Authority on \_\_\_\_\_

☒ the claims:

pages 111-118,120 and 127-141 as originally filed/furnished

pages\* NONE as amended (together with any statement) under Article 19

pages\* 119 and 121-126 received by this Authority on 26 May 2005 (26.05.2005)

pages\* NONE received by this Authority on \_\_\_\_\_

☒ the drawings:

pages 1-10 as originally filed/furnished

pages\* NONE received by this Authority on \_\_\_\_\_

pages\* NONE received by this Authority on \_\_\_\_\_

☐ a sequence listing and/or any related table(s) - see Supplemental Box Relating to Sequence Listing.

3. ☐ The amendments have resulted in the cancellation of:

☐ the description, pages \_\_\_\_\_

☐ the claims, Nos. \_\_\_\_\_

☐ the drawings, sheets/figs \_\_\_\_\_

☐ the sequence listing (*specify*): \_\_\_\_\_

☐ any table(s) related to the sequence listing (*specify*): \_\_\_\_\_

4. ☐ This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).

☐ the description, pages \_\_\_\_\_

☐ the claims, Nos. \_\_\_\_\_

☐ the drawings, sheets/figs \_\_\_\_\_

☐ the sequence listing (*specify*): \_\_\_\_\_

☐ any table(s) related to the sequence listing (*specify*): \_\_\_\_\_

5. ☐ This report has been established taking into account the **rectification of an obvious mistake** authorized by or notified to this Authority under Rule 91 (Rule 70.2(e)).

\* If item 4 applies, some or all of those sheets may be marked "superseded."

## INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.  
PCT/US05/04421**Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement****1. Statement**

Novelty (N)	Claims <u>15-18 and 24-238</u>	YES
	Claims <u>1-14 and 19-23</u>	NO
Inventive Step (IS)	Claims <u>NONE</u>	YES
	Claims <u>1-238</u>	NO
Industrial Applicability (IA)	Claims <u>1-238</u>	YES
	Claims <u>NONE</u>	NO

**2. Citations and Explanations (Rule 70.7)**

The present twelve parent claims 1, 24, 34, 53, 120, 128, 139, 146, 163, 187, 208 and 224 are related to the use of liquid PFPE precursor material to make microfluidic device as well as its applications. The device in Claim 24 may comprise a fluoroolefin-based elastomer, while different applications are specifically disclosed among Claims 34-238.

Claims 1-14 and 19-23 lack novelty under PCT Article 33(2) as being anticipated by Peterson et al. (US 6,335,224 B1). Peterson discloses a process for forming a microelectronic device, which may be a microfluidic device. The protective coating of such a device may be a liquid PFPE as specified (abstract, line 1-21; column 5, line 7-22; column 8, line 1-12; column 11, line 7-9). See component 14 as protective coating in Figures 1B and 1C.

Claims 15-18 and 24-238 lack an inventive step under PCT Article 33(3) as being obvious over Peterson et al. (US 6,335,224 B1) in view of Weers et al. (US 6,204,296 B1) and Linert et al. (US 2003/0139521 A1). Regarding Claims 15-18 and 24-238, Peterson has disclosed using a liquid PFPE in the device, but is silent about two things including: (A) using a two-component PFPE precursor system (Claim 15) and (B) the device comprising a fluoroolefin-based elastomer (Claim 24). A combination of Weers and Linert may teach both missing limitations. For instance, Weers teaches that PFEB (perfluoropolyether bromide, which is in the scope of PFPE) can be particularly used together with regular liquid PFPE so as to better stabilize fluorocarbon emulsion (column 13, line 43-49). Linert teaches that a fluorochemical composition may comprise a linear PFPE-containing polymer with other fluoropolymer (see paragraphs 0027-0034 and 0036-0037; particularly see paragraph 0029, line 10-11). By doing so, such a composition can be very useful for rendering a fibrous substrate oil and/water repellent (abstract, line 1-10). The skilled artisan would make the obvious connection to apply such two subject matters as described by Weers and Linert into Peterson's microfluidic device. Other Claims 34-238 are for different applications by using such a fluidic device containing such a liquid PFPE composition, the issue of inherent property may be thereby applied herefor the same or similar applications.